

1. (Amended) A process for producing a bio-catalyst, comprising the following steps:

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- a) utilizing an aqueous polyvinyl alcohol solution with a degree of hydrolysis of at least 98 mol%;
 - b) dissolving an additive in the aqueous polyvinyl alcohol solution which, if the overall solution is concentrated, forms a finely distributed aqueous phase separated from the polyvinyl alcohol solution;
 - c) adding a biologically active material selected from the group consisting of microorganisms, enzymes, spores, and cells;
 - d) dehydrating the overall solution up to a maximum residual water content of 50 wt.% in order to cause the phases to separate and the polyvinyl alcohol to gel; and
 - e) rehydrating the polyvinyl alcohol, including the biologically active material, in an aqueous medium.

2. The process according to Claim 1, wherein the polyvinyl alcohol solution has a concentration of 4 - 30 wt.%.

3. The process according to Claim 1, wherein the polyvinyl alcohol solution has a concentration of 6 - 16 wt.%.

4. (Amended) The process according to Claim 1, wherein the additive is used which has an affinity to water at least similar to that of the polyvinyl alcohol.

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5. (Amended) The process according to Claim 4, wherein the additive is selected from the group consisting of cellulose esters, cellulose ethers, starch esters, starch ethers, polyalkylene glycol ethers, polyalkylene glycols, long-chain alkanols ($n \geq 8$), sugar esters and sugar ethers.

6. The process according to Claim 1, wherein the additive includes polyethylene glycol.

7. The process according to Claim 6, wherein the additive has a concentration in a range of 4 - 20 wt.%.

8. The process according to Claim 6, wherein the additive has a concentration in a range of 6 - 10 wt.%.

9. The process according to Claim 1, wherein the dehydration of the aqueous solution is performed until a residual water content of at least 10 wt.% is reached.

10. The process according to Claim 1, wherein the dehydration of the aqueous solution is performed until a residual water content in a range of 10 - 30 wt.% is reached.

11. The process according to Claim 1, wherein the dehydrating of the aqueous solution is performed after dripping the aqueous solution onto a hard surface.

12. The process according to Claim 1, wherein the dehydrating of the aqueous solution is performed after pouring the aqueous solution into a form.

13. The process according to Claim 1, wherein the gel substance is formed with a diameter that is at least double a height of the gel substance.

14. The process according to Claim 1, wherein the gel substance is formed with a diameter of at least 1 mm and a height in a range between 0.1 and 1 mm.

15. The process according to Claim 1, wherein the gel substance is formed with a diameter in a range of between 2 mm and 4 mm and a height in a range between 0.2 mm and 0.4 mm.

16. The process according to Claim 1, wherein the dehydrating of the aqueous solution is performed after pouring the aqueous solution to form a long strand.

17. The process according to Claim 1, wherein the dehydrating of the aqueous solution is performed after pouring the aqueous solution onto a base material.

18. The process according to Claim 1, wherein the rehydrating the polyvinyl alcohol is performed in water.

19. The process according to Claim 1, wherein the rehydrating the polyvinyl alcohol is performed in a saline solution.

B³ 20. (Amended) The process according to Claim 19, further including the step of adding a biologically active material.

21. The process according to Claim 20, wherein a culture solution for the biologically active material is used as the saline solution.

22. The process according to Claim 21, wherein said culture solution contains polyvalent anions.

23. The process according to Claim 1, wherein additives, which alter specific gravity are added to the solution prior to dehydration.

24. The process according to Claim 1, wherein the dehydrating the aqueous solution is completely performed during a falling process in a drop tower and occurs during the time it takes a created a drop to fall in the drop tower.

B⁴ 25. (New) A mechanically highly stable bio-catalyst of polyvinyl alcohol produced according to the process set forth in Claim 1.

26. (New) A bio-catalyst according to Claim 25, produced in a lenticular form in which the diameter is significantly greater than the height.

27. (New) A bio-catalyst according to Claim 25, having a magnetic additive.

28. (New) A process for producing a product created by transformation with a bio-catalyst according to Claim 25.

B⁴ 29. (New) A process according to Claim 28 for producing 1,3-propane diol.

30. (New) A process according to Claim 29 for producing itaconic acid.
